

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-10. (Cancelled)

11. (Currently Amended) ~~The apparatus of claim 4,~~ A wiper fluid heater apparatus, comprising:

a heat exchanger having a wiper fluid inlet to allow wiper fluid to enter the heat exchanger and a wiper fluid outlet to allow the wiper fluid to exit the heat exchanger, wherein the heat exchanger further comprises a first end and a second end; and

a coolant passage traversing through the heat exchanger having a coolant inlet and a coolant outlet, the coolant inlet and coolant outlet operably coupled to an engine's coolant system to allow passage of engine coolant through the heat exchanger, wherein the wiper fluid directly contacts the coolant passage, and wherein the coolant passage has at least one extruded fin within the heat exchanger.

12. (Original) The apparatus of claim 11, wherein the coolant passage further comprises channels defined by fins that touch an outside wall of the heat exchanger point, the fins having an opening between every other fin allowing the wiper fluid to pass to the adjacent channel.

13. (Original) The apparatus of claim 12, wherein the wiper fluid inlet is operably coupled to an inlet channel and the wiper fluid outlet is operably coupled to an outlet channel.

14. (Original) The apparatus of claim 13, further comprising a thermal barrier between the inlet channel and the outlet channel.

15-16. (Cancelled)

17. (Currently Amended) ~~The system of claim 16,~~ A window washing system for a motor vehicle, comprising:

nozzle means located adjacent a vehicle window for directing washer fluid against the window;

a chamber for containing washer fluid;

a heat exchanger having an inlet connected to said chamber and an outlet connected to said nozzle means, the heat exchanger having a coolant passage plate and a first wiper fluid plate, wherein the first wiper fluid plate and coolant passage plate are held together by a fastening means and wherein the coolant passage plate allows the passage of coolant from the heat exchanger inlet to the heat exchanger outlet;

pumping means for transferring washer fluid from said chamber into said heat exchanger and from said heat exchanger to said nozzle means; and

means for circulating coolant from a motor cooling system into the heat exchanger with the washer fluid inside to thereby heat the fluid.

18. (Original) The system of claim 17, wherein the first wiper fluid plate contains a wiper fluid passage to route wiper fluid through the first plate to transfer heat from the engine coolant.

19. (Original) The system of claim 18, wherein a second wiper fluid plate is held to the coolant passage plate by a fastening means.

20. (Original) The system of claim 19, wherein the coolant passage plate further comprises a wiper fluid passage for wiper fluid to pass from the first wiper plate to the second wiper plate.

21. (Original) The system of claim 20, wherein the coolant passage plate has a plurality of wiper fluid plates held to it by a fastening means.

22. (Original) The system of claim 21, wherein each wiper fluid plate has a cover plate to enclose the wiper fluid passages.

23. (Original) The system of claim 18, wherein the wiper fluid passage is a spiral 10 passage.

24. (Original) The system of claim 18, wherein the wiper fluid passage contains imperfections to create fluid turbulence.

25. (Currently Amended) ~~The system of claim 15,~~ A window washing system for a motor vehicle, comprising:

nozzle means located adjacent a vehicle window for directing washer fluid against the window;

a chamber for containing washer fluid;

a heat exchanger having an inlet connected to said chamber and an outlet connected to said nozzle means, the heat exchanger having a coolant passage plate and a first wiper fluid plate, wherein the heat exchanger further comprises a coolant plate wherein an upper surface of the coolant plate has a coolant passageway for the motor coolant and a lower surface has a wiper fluid passageway for the wiper fluid;

pumping means for transferring washer fluid from said chamber into said heat exchanger and from said heat exchanger to said nozzle means; and

means for circulating coolant from a motor cooling system into the heat exchanger with the washer fluid inside to thereby heat the fluid.

26. (Original) The system of claim 25, wherein the coolant passageway is a spiral passage.

27. (Original) The system of claim 26, wherein the wiper fluid passageway is a spiral passage.

28. (Original) The system of claim 27, wherein the motor coolant and the wiper fluid flow in different directions within their respective passageways.

29-32. (Cancelled)

33. (Currently Amended) ~~The apparatus of claim 32,~~ A wiper fluid heater apparatus, comprising:

a heat exchanger having a wiper fluid inlet to allow wiper fluid to enter the heat exchanger and a wiper fluid outlet to allow the wiper fluid to exit the heat exchanger, the heat exchanger having a bypass passage;

a coolant passage traversing through the heat exchanger having a coolant inlet and a coolant outlet, the coolant inlet and coolant outlet operably coupled to an engine's coolant system to allow passage of engine coolant through the heat exchanger; and

a thermal actuator which actuates a gate routing the engine coolant flow to the bypass passage from the coolant passage when the wiper fluid becomes too hot.

34. (Original) The apparatus of claim 33, wherein the heat exchanger has a first chamber and a second chamber.

35. (Original) The apparatus of claim 34, wherein the coolant inlet is operably coupled to the first chamber and the coolant outlet is operably coupled to the second chamber.

36. (Original) The apparatus of claim 35, wherein the wiper fluid flows into the first chamber and then flows into the second chamber.

37. (Original) The apparatus of claim 35, wherein the first chamber pre-heats the wiper fluid and the second chamber heats the wiper fluid to a useable level.

38. (Original) The apparatus of claim 37, wherein the coolant passages traverses through the first and second chamber.

39. (Original) The apparatus of claim 34, wherein the heat exchanger further comprises a third chamber.

40. (Original) The apparatus of claim 39, wherein the coolant passage traverses through the first chamber.

41. (Original) The apparatus of claim 40, wherein the wiper fluid inlet is operably coupled to the second chamber where the wiper fluid is pre-heated by the first chamber.

42. (Original) The apparatus of claim 41, wherein the wiper fluid outlet is operably coupled to the third chamber where the wiper fluid remains heated by the first chamber.

43. (Original) The apparatus of claim 42, wherein the first chamber is smaller than the second chamber.

44. (Original) The apparatus of claim 34, wherein the coolant passage traverses through the first chamber.

45. (Original) The apparatus of claim 44, wherein the wiper fluid inlet is operably coupled to the second chamber where the wiper fluid is pre-heated by the first chamber.

46. (Original) The apparatus of claim 45, wherein the wiper fluid outlet is operably coupled to the first chamber.

47. (Original) The apparatus of claim 46, further comprising a pressure valve coupled to the wiper fluid outlet.

48. (Original) The apparatus of claim 47, further comprising a return wiper fluid outlet operably coupled to the second chamber, the return wiper fluid outlet operably coupled to the pressure valve.